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Approved For Release 2005/04/12 : CIA-RDP79-00798A000300020001-2

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28 November 73
(DATE)

MEMORANDUM FOR THE RECORD

SUBJECT: Opinion Request - *In-Depth Study of Catalytic Systems*

Attached is self-explanatory material from the Department of State.
May we have your opinion by 14 December 73.

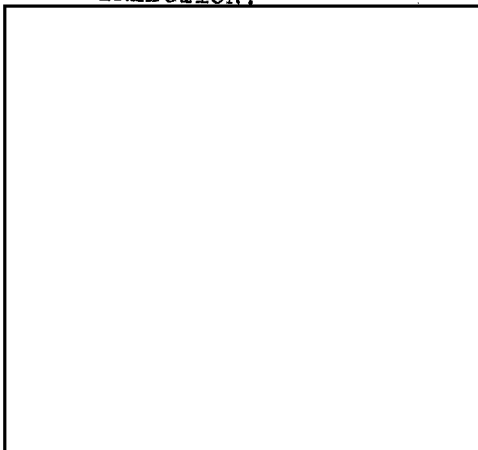
Please state degree of interest and whether we will receive requirements.

(IIAGE)

COMMENTS:

Please comment if you desire

DISTRIBUTION:



Chemical Catalysis

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State, USAF declassification & release instructions on file

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DEPARTMENT OF CHEMISTRY
PHONE: (414) 963-4411

14 November 1973

Professor O. V. Krylov
Deputy Director
Institute of Physical Chemistry
USSR Academy of Science
Moscow, USSR

Dear Professor Krylov:

I must apologize for the lengthy delay since my last letter to you of September 12, 1973. However, I had hoped to receive a response from either Dr. Sklyarov or Dr. Alchazov before making my final proposal to you. Since I feel we must now proceed with the final arrangements, I will present my suggestions for your comments.

We have completed the preparation of the alpha and gamma forms of bismuth molybdate. They have been characterized by X-ray diffraction and their surface areas are being determined. In addition, elemental analysis will be obtained in order to complete the characterization. I am prepared to send you samples of these catalysts, along with the results of the characterization. Moreover, I will place a portion of the catalysts in the catalyst bank. I propose that on the samples of nickel, cobalt, iron, magnesium and aluminum molybdates which you will place in the catalyst bank, you also provide X-ray data, surface area data and elemental composition data.

After our discussions in Moscow, I felt both of us were in general agreement as to the overall research program in catalytic oxidation. Furthermore, both of our programs are of such a nature that we are studying the oxidation reaction from a variety of viewpoints. I do not anticipate any difficulty in accommodating a Russian scientist into my research program, nor do I feel you would have any difficulty in utilizing one of my post doctoral fellows that I send to you. I would hope that we could begin the exchange of scientists within a few months, and I will wait to receive further details from you.

In addition to the exchange of catalyst samples which we have agreed upon in our working document, I would like to suggest the following in terms of our exchange of scientists:

1. The scientist whom I propose to send to work in your group will have a strong background in kinetics and adsorption phenomena in general. I would propose that he utilize either the technique of Mossbauer spectroscopy or ESCA for the characterization of catalysts which he will bring with him, or some that are of interest to you.

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We recently have been devoting the major portion of our research effort to the study of iron containing catalysts, and as you recall, I left one of our samples with Dr. Margolis when I visited her in Moscow. I would think the application of Mossbauer spectroscopy would be extremely useful in characterizing these catalysts with respect to the oxidation state of the iron in the samples. We now have completed an X-ray study of these samples, and Mossbauer data would complement the X-ray data quite nicely. Of course, the use of ESCA would also be very helpful in an attempt to characterize these catalysts.

2. I would be pleased to accept someone from your research group to assist me in our oxidation work. I propose to utilize your scientist to conduct mechanistic studies utilizing isotopic tracers, either oxygen 18 or deuterium. I think you are familiar with the approach I have used with isotopic oxygen in an attempt to characterize the mobility of lattice oxygen, so I will not go into further detail in this letter. Another possibility which was proposed to me by Dr. Alchazov and which I agree with, is the study of the oxidative dehydrogenation of deuterated butenes in an attempt to verify the allylic mechanism and characterize in some detail kinetic isotope effects. As Dr. Alchazov has suggested, as far as he knows no one has repeated the work of Adams and Jennings with deuterated butenes, and the results might be very interesting. I would very much be interested in studying this reaction on one of the catalysts in the catalyst bank, or with a catalyst you can provide, or one of our newer iron-containing catalysts.
3. I would like to personally spend two to four weeks working with you or Dr. Margolis, probably in May, 1974, or June, 1974. I would hope that we could use this time to discuss plans for the second year of our cooperation and to summarize in either the form of one or more papers, the results which we have obtained. I would plan to utilize this time to discuss with you in more detail my research program in oxidation, and hopefully be able to discuss with you in more detail your research program. I feel many of our ideas concerning catalytic oxidation are quite similar, and I would enthusiastically welcome the opportunity to discuss this area further with you.

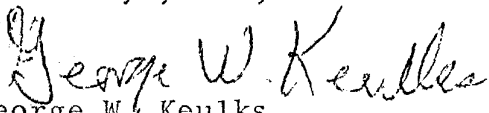
If my proposal is acceptable to you, would you please so indicate by return mail. In order to initiate the exchange of catalysts and scientists, please provide me with details as to how much of the catalyst samples you would like to receive and in what type of containers. I would also appreciate learning of the name of the individual who you would propose to send to my laboratory and an approximate date of his arrival. As far as my post doctoral fellow is concerned, I would like to know what would be a reasonable stipend for him.

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and some information concerning his housing arrangements, his salary in rubles, and the nature of his research program.

I shall be anxiously awaiting your reply, and I hope that you will have the opportunity to be visiting our laboratories in Milwaukee very soon.

Sincerely yours,


George W. Keulks
Chairman

GWK:ml

cc: W. K. Hall

ИНСТИТУТ ОРГАНИЧЕСКОЙ
ХИМИИ ИМ. Н. Д. ЗЕЛИНСКОГО
АКАДЕМИЯ НАУК СССР

Prof. V. B. Kazansky

INSTITUTE OF
ORGANIC CHEMISTRY
ACADEMY OF SCIENCES USSR

LENINSKY PROSPECT 47
MOSCOW B-334

STATINTL

*Chem catalysis "Theme III"
In-depth study of Selected Catalytic
Systems*

Dr. W. K. Hall,
The University of Wisconsin-Milwaukee,
Department of Chemistry,
Milwaukee, Wisconsin 53201, USA

2th November 1973.

*Ref
OG
AS
RL
file
USSR-S
Chem. Co*

Dear Dr. Hall,

Thank you very much for your letter of October 3 with the invitation for the common work on butene-1 isomerisation which we accept with pleasure. I completely agree with the plan of this work that you proposed. We can begin the preliminary experimental study of π -complexes by NMR just after receiving your samples. Please prepare them as soon as possible and send us. I believe that the amount of about 30 gram² will be quite sufficient. Both of the samples of zeolite and silica alumina are desirable, because the resolution of NMR spectra for zeolites due to the lower mobility of adsorbed molecules could be worse than for silica alumina. Another subject that we need for the common work is the pure 1-butene that is not available in the Soviet Union. Is it possible to send us even the minor amount of this product simultaneously with the samples of the catalysts?

What concerns the exchange between our laboratories with junior scientists, I would propose as the candidate to work

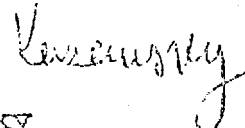
with you Dr. V. A. Shvets. He is a very capable young man quite familiar with kinetics and chromatography and a real expert in spectroscopy of any kind. I am sure you would have a good use of him for our common work and he ~~could~~ would learn a lot of new during it. At the moment we addressed the presidium of Academy of Sciences of USSR with the request to arrange his visit to USA in the beginning of 1974. We will let you know immediately about any details of his coming as soon as they are clear. We shall accept also with pleasure the junior scientist from your laboratory at any time convenient for him.

The program of our visit to USA is still not fixed. My feeling is that it is transferred on January 1974. In any case I hope to meet you again in the nearest future.

Thank you very much for the preprints of your papers that we are studying with great interest.

With best personal wishes,

Very truly yours


V. B. Kazansky

Harold Beuther
DIVISION DIRECTOR
PROCESS RESEARCH

P. O. Drawer 2038
Pittsburgh, PA 15230

October 29, 1973

Dr. W. Keith Hall
Department of Chemistry
The University of Wisconsin-Milwaukee
Milwaukee, WI 53201

Dear Keith:

I was very pleased by your offer of an appointment to act as a visiting scientist to the Soviet Union, and I wish to accept the offer, providing that I can obtain approval by GR&DC. All of my supervisors up to the department head have indicated that they think it is an excellent opportunity so that it is only the formal approval and financial details which must still be worked out. At present, I don't expect any insurmountable difficulties with these. I have contacted Dr. Merten to initiate a request for leave of absence, which should cause no trouble, and to see about handling the per diem money as you suggested. The latter will be more difficult; Dr. Merten said he would let me know promptly as to what arrangements can be made.

You indicated that you hoped to implement your program on or about January 1, 1974 with a three-month period which could be extended for another three months by mutual consent. This is quite satisfactory to me, but since my research program here will suffer about the same setback no matter when it is interrupted, I am quite flexible with regard to the starting date for the appointment. Also, I would be happy to work at the Institute of Organic Chemistry in Moscow, but am agreeable to visiting a different laboratory if that is necessary.

I am looking forward to this trip and am greatly curious as to what my assignment will be; meanwhile, I'll start learning Russian and hope that I can assimilate enough to function adequately.

10/29/73

FROM

C. L. Kibby

TO

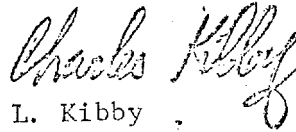
W. Keith Hall

SHEET NO. 2

Everyone here is fine, although most are concerned about the oil situation due to the Middle East war. Tony has a promising zeolite preparation for selective middle distillate production which we have started characterizing, and we seem always to be concerned with catalyst aging.

I hope that you and Gladys are finally getting settled and that your work in starting up a new research program is progressing well.

With my best regards,



C. L. Kibby

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CLK:jam

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